AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions of the claims.

LISTING OF CLAIMS

1. (Currently Amended) A machine adapted to assemble a dental product, the dental product having a body, first and second gears, and a tool, the machine comprising:

feeders for automatically supplying the component parts;

contiguous assembly stations coupled to the feeders for receiving the component parts and for performing assembly steps of the dental product, the assembly stations comprising a body station for receiving and holding the body of the product, at least two gear stations for introducing the first and second gears of the dental product into the body, and a tool station for connecting the tool to the second gear of the dental product, wherein the machine produces assembled dental products; and

a plurality of mounting posts, each mounting post adapted to support a dental prophylaxis angle as it is being assembled, wherein each mounting post has substantially the configuration of a Doriot nose for engaging the interior of the bodies without regard to their external configuration, and wherein each mounting post has a passageway therein positioned to align with a first drive shaft passage in the body, when the body is mounted on the mounting post, and a pin translatable in the passageway to selectively block the seating of a drive shaft in the first drive shaft passage in the body.

2. (Original) The machine of Claim 1 further comprising a lubricating station for applying lubricant to the gears of the dental product.

3. (Previously presented) The machine of Claim 1 further comprising a first conveyor for automatically moving assembled dental products to a bagging unit, the bagging unit automatically bagging the assembled dental products.

4. (Original) The machine of Claim 3 further comprising a batch-counting unit for automatically counting a batch of assembled and bagged dental products and placing the batch in a container, and a second conveyor for moving assembled and bagged dental products from the bagging unit to the batch-counting unit.

5. (Original) The machine of Claim 4 further comprising a batch conveyor system comprising a first accumulating conveyor for supplying containers to the batch-counting unit and a second accumulating conveyor for moving a container with the batch to an unloading station.

6. (Original) The machine of Claim 5 further comprising a carton-sealing unit for sealing the container, the carton-sealing unit being located on the second accumulating conveyor and prior to the unloading station.

7. (Currently Amended) A machine for automating the assembly of a dental product, the dental product comprising a body, first and second gears, and a tool, the machine comprising:

a moveable table having a plurality of fixtures that include mounting posts for holding the dental product during assembly;

a body feeder for supplying the body of the dental product;

a body transfer mechanism for moving the body from the body feeder to the fixtures;

a first gear feeder for supplying the first gear of the dental product;

a first gear transfer mechanism for moving the first gear from the first gear feeder and locating it in the body of the dental product;

a second gear feeder for supplying the second gear of the dental product;

a second gear transfer mechanism for moving the second gear from the second gear feeder and locating it in the body of the dental product;

a tool feeder for supplying the tool of the dental product;

a tool transfer mechanism for moving the tool and attaching it to the dental product; and

an assembled dental product transfer mechanism for transferring an assembled dental product from the moveable table, wherein each mounting post has substantially the configuration of a Doriot nose for engaging the interior of the bodies without regard to their external configuration, and wherein each mounting post has a passageway therein positioned to align with a first drive shaft passage in the body, when the body is mounted on the mounting post, and a pin translatable in the passageway to selectively block the seating of a drive shaft in the first drive shaft passage in the body.

8. (Previously presented) The machine of Claim 7 further comprising a lubricator for lubricating the first and second gears of the dental product.

9. (Previously presented) The machine of Claim 7 further comprising sensors for detecting the presence of the body, the first and second gears, and the tool to ensure that the dental product has been properly assembled.

10. (Previously presented) The machine of Claim 9 further comprising an assembled product diverter for separating assembled dental products having the body, first and second gears, and the tool from those assembled dental products that are missing either the body, first and second gears, or the tool.

11. (Previously presented) The machine of Claim 7 further comprising a first conveyor for automatically moving assembled dental products to a bagging unit, the bagging unit automatically bagging the assembled dental products.

12. (Original) The machine of Claim 11 further comprising a batch-counting unit for automatically counting a batch of assembled and bagged dental products and placing the batch in a container, and a second conveyor for moving assembled and bagged dental products from the bagging unit to the batch-counting unit.

13. (Original) The machine of Claim 12 further comprising a batch conveyor system comprising a first accumulating conveyor for supplying containers to the batch-counting unit and a second accumulating conveyor for moving a container with the batch to an unloading station.

14. (Original) The machine of Claim 13 further comprising a carton-sealing unit for sealing the container, the carton-sealing unit being located on the second accumulating conveyor and prior to the unloading station.

15. (Currently Amended) A machine for automating the assembly of a dental prophylaxis angle, the angle comprising a body, two gears, and a prophy cup, the machine comprising:

feeders for the body, the two gears, and the prophy cup;

transfer mechanisms for moving the body, the two gears, and the prophy cup from the feeders to an assembly table and for assembling the body, the two gears, and the prophy cup into an assembled dental prophylaxis angle, each body being positioned onto a mounting post located on the assembly table, wherein each mounting post has substantially the configuration of a Doriot nose for engaging the interior of the bodies without regard to their external configuration, and wherein each mounting post has a passageway therein positioned to align with a first drive shaft passage in the body, when the body is mounted on the mounting post, and a pin translatable in the passageway to selectively block the seating of a drive shaft in the first drive shaft passage in the body;

sensors for distinguishing correctly assembled angles from incorrectly assembled angles;

an assembled angle diverter for diverting incorrectly assembled angles to a reject location and for diverting correctly assembled angles to a first conveyor;

a bagging unit for receiving correctly assembled angles from the first conveyor and automatically bagging the correctly assembled angles;

a second conveyor for moving the bagged angles from the bagging unit;

a batch-counting unit for receiving the bagged angles and counting a batch comprising a predetermined number of angles, and for placing the batch into one of a plurality of containers to form a filled container;

a first accumulating conveyor for supplying the plurality of containers to the batch-counting unit;

a second accumulating conveyor for moving the filled container from the batch-counting unit; and

a container sealer for sealing the filled container.

16-28. (Cancelled)

29. (Currently Amended) In a machine for assembling a dental device, the dental device comprising a body and first and second gears, the machine comprising:

a movable table;

a plurality of fixtures located on the movable table having a mounting post thereon for holding the body of the dental device during phases of assembly;

a plurality of stations that perform steps of assembly of the dental device in sequence with the movable table;

a body feeder for supplying the body to a body isolator, the body isolator isolating a single body from the body feeder, and a body pick-and-place unit for moving the isolated body from the body isolator to one of the fixtures;

a first gear feeder for supplying the first gear to a first gear isolator, the first gear isolator isolating a single first gear from the first gear feeder, and a first gear pick-and-place unit for moving the isolated first gear from the first gear isolator to one of the fixtures on which a body is located; and

a second gear feeder for supplying the second gear to a second gear isolator, the second gear isolator isolating a single second gear from the second gear feeder, and a second gear pick-and-place unit for moving the isolated second gear from the second gear isolator to one of the fixtures on which a body and first gear are located, wherein each mounting post has substantially the configuration of a Doriot nose for engaging the interior of the bodies without regard to their external configuration, and wherein each mounting post has a passageway therein positioned to align with a first drive shaft passage in the body, when the body is mounted on the mounting post, and a pin translatable in the passageway to selectively block the seating of a drive shaft in the first drive shaft passage in the body.

30. (Original) The machine of claim 29 wherein the dental device also comprises a tool and the machine further comprising a tool feeder for supplying the tool to a tool isolator, the tool isolator isolating a single tool from the tool feeder, and a tool pick-and-place unit for moving the isolated tool from the tool isolator and placing it on the second gear.

31. (Currently Amended) A system for making dental prophylaxis angles, the system comprising a plurality of mounting posts, each adapted to support components of a dental prophylaxis angle as the components are being assembled into a dental prophylaxis angle, a movable table for carrying the mounting posts through a plurality of stations at which different assembly steps are performed;

a body station which takes an oriented body and places it on the mounting post at the body station;

a first gear member station which takes an oriented first gear member and places it in the body on the mounting post at the first gear member station;

a second gear member station which takes an oriented second gear member and places it in the body on the mounting post at the second gear member station; and

a tool station which attaches a tool to the second gear member in the body on the mounting post at the tool station, wherein each mounting post has substantially the configuration of a Doriot nose for engaging the interior of the bodies without regard to their external configuration, and wherein each mounting post has a passageway therein positioned to align with a first drive shaft passage in the body, when the body is mounted on the mounting post, and a pin translatable in the passageway to selectively block the seating of a drive shaft in the first drive shaft passage in the body.

32. (Previously presented) The system according to Claim 31 further comprising a closing station for closing a hinged closure on the body to enclose the first and second gear members in the body on the mounting post at the closing station.

33. (Previously presented) The system according to Claim 31 further comprising a lubrication station for injecting lubricant into the body adjacent to the first gear member, and a first gear member seating station for seating the first gear member in a bearing in the body on the mounting post at the first gear member seating station.

34. (Cancelled)

35. (Previously presented) The system according to Claim 34 wherein the mounting posts are adapted for engaging the interior of the bodies without any contact with the exterior of the bodies.

36. (Cancelled)

37. (Currently Amended) A system for making dental prophylaxis angles, the system comprising a plurality of mounting posts, each adapted to support the components of a dental prophylaxis angle as the components are being assembled into a dental prophylaxis angle, a table for carrying the mounting posts past a plurality of stations at which different assembly steps are performed;

a body feeder that orients bodies from bodies loaded therein;

a body station which takes an oriented body and places it on the mounting post at the body station;

a first gear member feeder that orients first gear members from first gear members loaded therein;

a first gear member station which takes an oriented first gear member and places it in the body on the mounting post at the first gear member station;

a second gear member feeder that orients second gear members from second gear members loaded therein;

a second gear member station which takes an oriented second gear member and places it in the body on the mounting post at the second gear member station;

a tool feeder that orients tools from tools loaded therein;

a tool station which takes an oriented tool and attaches it to the second gear member in the body on the mounting post at the tool station, wherein each mounting post has substantially the configuration of a Doriot nose for engaging the interior of the bodies without regard to their external configuration, and wherein each mounting post has a passageway therein positioned to align with a first drive shaft passage in the body, when the body is mounted on the mounting post, and a pin translatable in the passageway to selectively block the seating of a drive shaft in the first drive shaft passage in the body.

38. (previously presented) The system according to Claim 37 further comprising a closing station for closing a hinged closure on the body to enclose the first and second gear members in the body on the mounting post at the closing station.

39. (Previously presented) The system according to Claim 37 further comprising a lubrication station for injecting lubricant into the body adjacent to the first gear member, and a first gear member seating station for seating the first gear member in a bearing in the body on the mounting post at the first gear member seating station.

40. (Previously presented) The system according to Claim 37 wherein the tool station includes support for engaging the body as the tool is applied to the second gear member.

41. (Cancelled)

42. (Previously presented) The system according to Claim 41 wherein the mounting posts are adapted for engaging the interior of the bodies without any contact with the exterior of the bodies.

43. (Cancelled)

44. (Currently Amended) A system for making dental prophylaxis angles, the system comprising a plurality of mounting posts, each adapted to support a dental prophylaxis angle as it is being assembled, the posts moving in series through a plurality of stations at which a different assembly step is performed, the assembly step at each station being performed on that dental prophylaxis angle at its respective mounting post substantially simultaneously, wherein each mounting post has substantially the configuration of a Doriot nose for engaging the interior of the bodies without regard to their external configuration, and wherein each mounting post has a passageway therein positioned to align with a first drive shaft passage in the body, when the body is mounted on the mounting post, and a pin translatable in the passageway to selectively block the seating of a drive shaft in the first drive shaft passage in the body.

45. (Cancelled)

46. (Currently Amended) The system according to Claim [[45]] 44 wherein the mounting posts are adapted for engaging the interior of the bodies without any contact with the exterior of the bodies.

47-49. (Cancelled)

50. (Previously presented) The machine of Claim 1 wherein the machine produces assembled dental prophylaxis angles.

51. (Previously presented) The machine of Claim 7 wherein the machine produces assembled dental prophylaxis angles.

52. (Cancelled)

53. (Previously presented) The machine of Claim 29 wherein the machine produces assembled dental prophylaxis angles.

54. (Previously presented) The machine of Claim 1 wherein the feeders include:

at least one vibratory feeder bowl that automatically orients bodies from bodies loaded therein;

at least one vibratory feeder bowl that automatically orients first gears from first gears loaded therein;

at least one vibratory feeder bowl that automatically orients second gears from second gears loaded therein; and

at least one vibratory feeder bowl that automatically orients tools from tools loaded therein.

55. (Previously presented) The machine of Claim 1 wherein each said assembly station is dedicated to performing a different one of the operations in the assembly of the dental product, the assembly operation at each station being performed substantially simultaneously with the performance of the assembly operations at the other stations.

56. (Previously presented) The machine of Claim 7 wherein:

the body feeder includes at least one vibratory feeder bowl that automatically orients bodies from bodies loaded therein;

the first gear feeder includes at least one vibratory feeder bowl that automatically orients first gears from first gears loaded therein;

the second gear feeder includes at least one vibratory feeder bowl that automatically orients second gears from second gears loaded therein; and

the tool feeder includes at least one vibratory feeder bowl that automatically orients tools from tools loaded therein.

57. (Previously presented) The machine of Claim 7 wherein the machine comprises a plurality of assembly stations generally surrounding the moveable table, each said station being dedicated to performing a different one of the operations in the assembly of the dental product, the assembly operation at each station being performed substantially simultaneously with the performance of the assembly operations at the other stations.

58. (Previously presented) The machine of Claim 15 wherein the feeders include:

at least one vibratory feeder bowl that automatically orients bodies from bodies loaded therein;

at least one vibratory feeder bowl that automatically orients gears from gears loaded therein; and

at least one vibratory feeder bowl that automatically orients prophy cups from prophy cups loaded therein.

59. (Previously presented) The machine of Claim 15 wherein the machine comprises a plurality of assembly stations generally surrounding the assembly table, each said station being dedicated to performing a different one of the operations in the assembly of the body, the two gears, and the prophy cup into an assembled dental prophylaxis angle, the assembly operation at each station being performed substantially simultaneously with the performance of the assembly operations at the other stations.

60. (Previously presented) The machine of Claim 29 wherein:

the body feeder includes at least one vibratory feeder bowl that automatically orients bodies from bodies loaded therein;

the first gear feeder includes at least one vibratory feeder bowl that automatically orients first gears from first gears loaded therein; and

the second gear feeder includes at least one vibratory feeder bowl that automatically orients second gears from second gears loaded therein.

61. (Previously presented) The machine of Claim 29 wherein each said station is dedicated to performing a different one of the operations in the assembly of the dental device, the assembly operation at each station being performed substantially simultaneously with the performance of the assembly operations at the other stations.

62. (Previously presented) The machine of Claim 30 wherein the tool feeder includes at least one vibratory feeder bowl that automatically orients tools from tools loaded therein.

63. (Previously presented) The system of Claim 31 wherein each said station is dedicated to performing a different one of the operations in the assembly of the dental prophylaxis angle, the assembly operation at each station being performed substantially simultaneously with the performance of the assembly operations at the other stations.

64. (Previously presented) The system of Claim 31 wherein each said mounting post includes an external portion complimentary in shape to an interior portion of the body of the dental prophylaxis angle for securely engaging and supporting the body as the components are being assembled into the dental prophylaxis angle.

65. (Previously presented) The system of Claim 32 wherein the closing station includes a closer mechanism for engaging and moving a closure member of the body to a closed position in which the hinged closure on the body is closed, and an actuator linkage coupled to the closer mechanism, the actuator linkage being moveable between open and closed positions such that when the actuator linkage is activated it moves the closer mechanism to engage and move the closure member to the closed position.

66. (Previously presented) The system of Claim 37 wherein:

the body feeder includes at least one vibratory feeder bowl that automatically orients bodies from bodies loaded therein;

the first gear member feeder includes at least one vibratory feeder bowl that automatically orients first gear members from first gear members loaded therein;

the second gear member feeder includes at least one vibratory feeder bowl that automatically orients second gear members from second gear members loaded therein; and

the tool feeder includes at least one vibratory feeder bowl that automatically orients tools from tools loaded therein.

67. (Previously presented) The system of Claim 37 wherein each said station is dedicated to performing a different one of the operations in the assembly of the dental prophylaxis angle, the assembly operation at each station being performed substantially simultaneously with the performance of the assembly operations at the other stations.

68. (Previously presented) The system of Claim 37 wherein each said mounting post includes an external portion complimentary in shape to an interior portion of the body of the dental prophylaxis angle for securely engaging and supporting the body as the components are being assembled into the dental prophylaxis angle.

69. (Previously presented) The system of Claim 44 wherein each said station is dedicated to performing a different one of the operations in the assembly of the dental

prophylaxis angle, the assembly operation at each station being performed substantially simultaneously with the performance of the assembly operations at the other stations.